with the house and was afterward found in an unconscious condition, lying in a slough, about fifty yards from where the house had stood. His injuries consisted of bruises and a broken arm, but were nor fatal. The storm extended about 20 miles in length and was only about 40 rods in width.

27th.—Two tornadoes occurred in Hanson and McCook counties, S. Dak.; 2 persons were injured and the property loss was about $15,000.

28th.—The following is from the report of the Iowa Climate and Crop Service, April 1896:

On the night of the 28th a severe windstorm, having some of the characteristics of a tornado, passed through Poweshiek County, Iowa, in a northeasterly direction, the line of greatest force being about 4 miles east of Grinnell. One house, belonging to Mr. C. Ingerman, was turned on its foundation and badly wrecked. A number of other buildings were unroofed or badly damaged, and the general destruction of property was considerable, but happily no person was seriously injured. The storm appears to have been a heavy squall, with occasional gyratory movement of the wind. It was probably the nearest approach to a tornado that was noted within the State during that month of frequent storms.

A destructive windstorm was reported as having occurred in the vicinity of Centralia, Mo., but inquiry fails to elicit any of the details.

High winds and unusually heavy rains were also reported from points in northeastern Iowa, western Kansas, eastern Colorado, Nebraska, South Dakota, Minnesota, and Wisconsin.

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers. Both the mean temperatures and the departures from the normal are given in Table I for the regular stations of the Weather Bureau.

The *monthly mean temperatures* published in Table I, for the regular stations of the Weather Bureau, are the simple means of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table V for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution of the observed monthly mean* temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart IV; the lines are drawn over the Rocky Mountain Plateau Region, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The *highest mean temperatures* were: Key West, 75.0; Jupiter, 72.0; Tampa, 71.2; Corpus Christi, 70.8; Montgomery, 70.2.

The *lowest mean temperatures* were: In the United States: Duluth, 38.1; Havre, Helena, and Lander, 39.4; Eastport, 39.6; Sault Ste. Marie, 40.0. In Canada: St. Johns, N. F., 32.0; Minnedosa, 32.4; Prince Albert, 32.6.

As compared with the normal for April the mean temperatures for the current month were above the normal in all regions except the northern Slope, the southern, middle, and northern plateaus, and the Pacific Coast. The greatest excesses were: Lexington and Cleveland, 8.5; Port Stanley, 8.2; St. Louis, 8.1; Saugeen and Port Huron, 8.0. The greatest deficits were: Redbluff, 8.3; Fresno, 7.3; Winnemucca, 7.2; Edmonton, 6.6; Walla Walla and Carson City, 6.3; Portland, Me., Roseburg, and Sacramento, 6.2.

Considered by districts the mean temperatures for the current month show departures from the normal as given in Table I. The greatest positive departures were: Middle Slope, 16.5; Missouri Valley, 14.6. The greatest negative departures were: Florida Peninsula, 9.7; east Gulf, 4.8.

The *years of highest and lowest mean temperatures* for April are shown in Table I of the REVIEW for April, 1894. The mean temperature for the current month was the highest on record at: Harrisburg, 54.4; Pittsburg, 57.2; Cleveland, 53.4; Columbus, 58.6; Parkersburg, 59.7; Cincinnati, 61.6; Indianapolis, 60.0; Chicago, 53.4; Greenbay, 47.7; Dubuque, 55.0; Davenport, 57.1; Springfield, Ill., and Keokuk, 60.0; Des Moines, 56.0; Concordia, 61.0; Topeka, 62.8; Dodge City, 59.9; Wichita, 63.7; Kansas City, 61.4; Columbia, Mo., 63.6; Springfield, Mo., 62.8; St. Louis, 64.8; Cairo, 65.8; Louisville, 64.6; Lexington, 61.8; Raleigh, 63.6; Charlotte, 64.8; Knoxville, 63.8; Chattanooga, 65.0; Nashville, 65.1; Meridian, 69.0; Fort Smith, 68.0; Little Rock, 68.4; Vicksburg, 70.4; Montgomery, 70.2; Atlanta, 65.7. It was the lowest on record at: Neahbay, 44.8; Roseburg, 46.3; Redbluff, 52.2; Winnemucca, 40.6; Carson City, 42.6; Sacramento, 53.3; San Francisco, 51.6; Fresno, 54.7; Los Angeles, 56.2; Yuma, 65.8.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: 96, Cape Henry (19th), Columbia, S. C. (18th); 95, Lynchburg, Norfolk, and Raleigh (18th); 94, Baltimore (18th), Charlotte (17th); 93, Philadelphia, Washington, Parkersburg (18th), Augusta (17th). The lowest maxima were: 59, Port Angeles (20th); 60, Duluth (19th), Tatoosh Island (24th); 61, Fort Canby (4th); 62, Neahbay (24th), Eureka (4th). The highest minima were: 66, Key West (3d); 53, Port Eads (frequently), Corpus Christi (2d); 51, Jupiter (14th). The lowest minima were: 5, Lander (1st); 6, Helena (16th), Havre (17th); 8, Cheyenne (1st); 9, Denver (2d); 10, Williston (16th).

The *years of highest maximum and lowest minimum temperatures* are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: Northfield, 81; Albany, 88; New Haven, 85; Block Island, 71; Nantucket, 70; Woods Hole, 69; Vineyard Haven, 79; New York, 90; Philadelphia, 93; Harrisburgh, 92; Pittsburg, 90; Columbus, Ohio, 89; Sandusky, 88; Toledo, 86; Detroit, 85; Port Huron, 84; Greenbay, 84; Milwaukee, 85; Toledo, 86, Indianapolis, 87; Cincinnati, 87; Parkersburg, 93; Baltimore, 94; Washington, 93; Cape Henry, 96; Norfolk, 95; Lynchburg, 95; Lexington, 88; Knoxville, 90; Chattanooga, 90; Atlanta, 89; Charlotte, 94; Raleigh, 95; Columbia, S. C., 96; Savannah, 90; Jacksonville, 92. The minimum temperatures were the lowest on record at: Harrisburg, 24; Greenbay, 11; Minneapolis, 15; Havre and Helena, 6; Neahbay, 27; Fort Canby, 34; Astoria, 32; Idaho Falls, 13; Salt Lake City, 18; Redbluff, 34; Sacramento, 36; Fresno, 34; Los Angeles, 38; Pueblo, 15; Amarillo, 24; Columbia, Mo., 21.

The greatest daily range of temperature and the extreme monthly ranges are given for each of the regular Weather Bureau stations in Table I, which also gives data from which may be computed the extreme monthly ranges for each station. The largest values of the greatest daily ranges were: Pueblo, 47; Northfield and Dodge City, 46; Elpaso, 45; Portland, Me., and Sandusky, 44. The smallest values were: Port Eads, 10; Key West, 12; Galveston, 16; Corpus Christi and Tatoosh Island, 17; San Francisco, 18; Hatteras, 19; Jupiter and New Orleans, 20. Among the extreme monthly ranges the largest values were: Dodge City, 76; Greenbay, 73; Milwaukee and Denver, 71; Concordia, 70. The smallest values were: Key West, 17; San Francisco, 25; Point Reyes Light, 26; Tatoosh Island, Fort Canby, and Eureka, 27.

The *accumulated monthly departures* from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column for comparison with the departures of current conditions of vegetation from the normal condition.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
West Gulf	+ 2.8	+ 0.7	New England	— 3.7	— 0.9
Ohio Valley and Tenn.	+ 2.0	+ 0.5	Middle Atlantic	— 2.0	— 0.5
Lower Lake	+ 2.0	+ 0.5	South Atlantic	— 2.2	— 0.6
Upper Lake	+ 9.8	+ 2.4	Florida Peninsula	— 9.7	— 2.4
North Dakota	+ 6.0	+ 1.5	East Gulf	— 4.8	— 1.2
Upper Mississippi	+12.7	+ 3.2			
Missouri Valley	+14.6	+ 3.6			
Northern Slope	+ 8.9	+ 2.2			
Middle Slope	+16.5	+ 4.1			
Abilene (southern Slope)	+10.0	+ 2.5			
Southern Plateau	+ 3.8	+ 1.0			
Middle Plateau	+ 4.9	+ 1.2			
Northern Plateau	+17.4	+ 4.4			
North Pacific	+ 0.9	+ 0.2			
Middle Pacific	+ 2.2	+ 0.6			
Southern Pacific	+ 4.5	+ 1.1			

The limit of freezing weather is shown on Chart VI by the isotherm of minimum 32°, and the limit of frost by the isotherm of minimum 40°.

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by the weight of the vapor coexisting with the air contained in a cubic foot of space, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer, but a properly constructed evaporometer may be made to give the *quantity* of water evaporated from a similar surface during any interval of time. Such an evaporometer, therefore, would sum up or integrate the effects of those influences that determine the temperature as given by the wet bulb; from this quantity the *average humidity of the air* during any given interval of time may be deduced.

Measurements of evaporation within the thermometer shelters are difficult to make so as to be comparable at temperatures above and below freezing, and may be replaced by computations based on the wet-bulb temperatures. The absolute amount of evaporation from natural surfaces not protected from wind, rain, sunshine, and radiation, are being made at a few experimental stations and will be discussed in special contributions.

Sensible temperatures.—The sensation of temperature experienced by the human body and ordinarily attributed to the condition of the atmosphere depends not merely on the temperature of the air, but also on its dryness, on the velocity of the wind, and on the suddenness of atmospheric changes, all combined with the physiological condition of the observer. A complete expression for the relation between atmospheric conditions and nervous sensations has not yet been obtained.

PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The total precipitation for the current month was heaviest (from 6 to 18 inches) in the coastal and mountainous regions of northern California, Washington, and Oregon. Areas of 8 to 10 inches were reported from eastern Nebraska, inclosed within a much larger region of over 6 inches.

The larger values at regular stations were: Eureka, 11.1; Astoria, 9.2; Neahbay, 7.9; Greenbay, 7.5.

The *diurnal variation*, as shown by tables of hourly means of the total precipitation, deduced from self-registering gauges kept at the regular stations of the Weather Bureau, is not now tabulated.

The *current departures* from the normal precipitation are given in Table I, which shows that precipitation was in excess over the upper Lake Region, upper Mississippi, and lower Missouri valleys, Manitoba, Washington, Oregon, and northern California. It was deficient in the Atlantic States. The large excesses were: Eureka, 7.0; Dubuque, 5.0; Winnipeg, 4.3; Dodge City, 3.9; La Crosse, 3.6; Greenbay and Astoria, 3.3. The large deficits were: Fort Smith, 4.6; Louisville, 4.2; Vicksburg, 3.6; Palestine, 3.4; Atlanta, 3.1; Nantucket and Hatteras, 3.0.

The *average departure* for each district is also given in Table I. By dividing these by the respective normals the following corresponding percentages are obtained (precipitation is in excess when the percentages of the normals exceed 100):

Above the normal: Lower Lake, 109; upper Lake, 147; North Dakota, 160; upper Mississippi, 130; Missouri Valley, 138; northern Slope, 106; middle Slope, 109; middle Plateau, 145; northern Plateau, 120; north Pacific, 127; middle Pacific, 236.

Normal: Southern Plateau, 100.

Below the normal: New England, 38; middle Atlantic, 37; south Atlantic, 42; Florida Peninsula, 46; east Gulf, 61; west Gulf, 56; Ohio Valley and Tennessee, 57; southern Plateau, (Abilene), 41; southern Pacific, 92.

The years of greatest and least precipitation for April are given in the REVIEW for April, 1890. The precipitation for the current month was the greatest on record at: Williston, 2.86; St. Paul, 5.63; Greenbay, 5.48; La Crosse, 5.84; Minneapolis, 5.12; Huron, 6.17; Sioux City, 6.16; Dubuque, 7.80; Topeka, 4.00; Dodge City, 5.50; Winnemucca, 1.95; Eureka, 11.13; Point Reyes Light, 4.20; Fresno, 2.82. It was the least on record at: Eastport, 0.86; New Haven, 1.19; Nantucket, 0.62; Narragansett Pier, 1.38; Woods Hole, 1.33; Harrisburg, 1.19; Washington, 1.07; Cincinnati, 0.59; Indianapolis, 1.27; Louisville, 0.40; Lexington, 0.40; Wilmington, 0.64; Atlanta, 0.58; Fort Smith, 0.46.

The total accumulated monthly departures from normal precipitation from January 1 to the end of the current month are given in the second column of the following table; the third column gives the ratio of the current accumulated precipitation to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
	Inches.	*Per ct.*		*Inches.*	*Per ct.*
Lower Lakes	+ 1.00	109	New England	— 2.80	82
North Dakota	+ 2.30	157	Middle Atlantic	— 1.80	85
Northern Slope	+ 0.50	114	South Atlantic	— 3.70	77
Middle Plateau	+ 0.90	116	Florida Peninsula	— 0.60	94
North Pacific	+ 4.40	120	East Gulf	— 4.00	80
Middle Pacific	+ 2.40	114	West Gulf	— 2.50	83
			Ohio Valley and Tenn.	— 5.60	68
			Upper Lakes	— 0.70	92
			Upper Mississippi	— 1.30	86
			Missouri Valley	— 0.50	93
			Middle Slope	— 1.50	73
			Abilene (southern Slope)	— 2.90	54
			Southern Plateau	— 0.40	79
			Northern Plateau	— 1.10	85
			South Pacific	— 1.60	79

Details as to *excessive precipitation* are given in Tables XII and XIII.

The *total monthly snowfall* at each station is given in Table II. Its geographical distribution is shown on Chart VI. The southern limit of freezing temperatures and possible snow is shown on this chart by the isotherm of minimum 32°. The isotherm of minimum 40°, namely, the air temperature within the thermometer shelter, is also given on this chart,